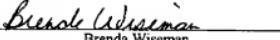


IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

<p>ART UNIT: 1796 EXAMINER: Patrick Dennis Niland <b>FIRST NAMED</b> INVENTOR: Phillip C. Cagle SERIAL NO.: 10/772,792 FILED: 2/5/2004 CONF. NO.: 5227 FOR: POLYMER COLLOID-CONTAINING INK-JET INKS FOR PRINTING ON NON-POROUS SUBSTRATES DOCKET NO.: 200316243-1</p>	<p><b><u>CERTIFICATE OF MAILING</u></b> <b><u>UNDER 37 C.F.R. § 1.8</u></b> DATE OF DEPOSIT: 11/04/2008  I hereby certify that this paper or fee (along with any paper or fee referred to as being attached or enclosed) is being submitted on the date indicated above via: <input checked="" type="checkbox"/> EFS Web <input type="checkbox"/> facsimile to 571-273-8300 <input type="checkbox"/> the United States Postal Service with sufficient postage as first class mail addressed to: Mail Stop _____, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.   Brenda Wiseman</p>
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APPELLANTS' APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450  
Mail Stop Appeal Brief – Patents

Dear Sir:

Appellants submit this appeal brief in connection with their appeal from the final rejection of the Patent Office, mailed April 17, 2008, and in connection with the Advisory Action, mailed August 13, 2008, for the above-identified application. A Notice of Appeal was filed on September 4, 2008.

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I. REAL PARTY IN INTEREST

The real party in interest is Hewlett-Packard Development Company, LP, a limited partnership established under the laws of the State of Texas and having a principal place of business at 20555 S.H. 249 Houston, TX 77070, U.S.A. (hereinafter "HPDC"). HPDC is a Texas limited partnership and is a wholly-owned affiliate of Hewlett-Packard Company, a Delaware Corporation, headquartered in Palo Alto, CA. The general or managing partner of HPDC is HPQ Holdings, LLC.

II. RELATED APPEALS AND INTERFERENCES

Appellants and Appellants' legal representatives know of no other appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 12-16, 18, 23, 25-30, 32, 37, and 39-44 remain pending. Claims 1-11, 17, 19-22, 24, 31, 33-36, and 38 have been canceled. Thus, the claims on appeal in this application are claims 12-16, 18, 23, 25-30, 32, 37, and 39-44, which constitute all of the claims presently pending for consideration.

**IV. STATUS OF AMENDMENTS**

No amendments to pending claims 12-16, 18, 23, 25-30, 32, 37, and 39-44 have been made since the Office Action mailed on April 17, 2008, which was the final rejection of the pending claims.

V. SUMMARY OF CLAIMED SUBJECT MATTER

References are indicated in page:line number format.

12. A system for printing images (2:19, 7:18-26), comprising:

a) an ink-jet ink (2:19-20, 6:17 – 7:17), including:

i) an aqueous liquid vehicle having at least one volatile co-solvent, each volatile co-solvent present having a boiling point at or below about 285°C, wherein the total amount of volatile co-solvent present in the ink-jet ink is from 5 wt% to 50 wt% (2:20-23, 3:19-30, 5:15-19, 7:12-32, 8:7 – 10:8),

ii) acid-functionalized polymer colloid particulates dispersed in the liquid vehicle, said acid-functionalized polymer colloid particulates including surface acid groups, said surface acid groups provided by acid monomers copolymerized with other monomers to form the polymer colloid particulates, said acid monomers being present at from 1 wt% to 15 wt% of total monomers used to form the polymer colloid particulates (2:23-25, 4:17 – 5:14, 6:29 – 8:2, 12:1 – 14:8), and

iii) polymer-encapsulated pigment colorants dispersed in the liquid vehicle (3:31 – 4:16, 7:15-21, 12:1-10);

b) a thermal ink-jet printhead configured for printing ink-jet ink (2:25-26, 7:24-26, 14:30 – 15:6, 16:11-25);

c) a non-porous substrate configured for receiving the ink-jet ink upon printing with the ink-jet printhead (2:25-26, 5:24-28, 7:24-29, 9:6-8, 14:23-29, 16:11-25); and

d) a heating element configured for heating the image once it is printed on the non-porous substrate (14:9-22).

26. A method of printing an image with good rub resistance (2:29-30, 7:27 – 8:2), comprising:

- a) ink-jetting from a thermal ink-jet printhead an ink-jet ink onto a non-porous substrate to form the image, said ink-jet ink including (2:29-30, 5:24-28, 7:27-29, 9:6-8, 14:23-29, 16:11-25):
  - i) an aqueous liquid vehicle having at least one volatile co-solvent, each volatile co-solvent present having a boiling point at or below about 285°C, wherein the total amount of volatile co-solvent present in the ink-jet ink is from 5 wt% to 50 wt% (2:20-31, 3:19-30, 5:15-19, 7:12-32, 8:7 – 10:8);
  - ii) acid-functionalized polymer colloid particulates dispersed in the liquid vehicle; said acid-functionalized polymer colloid particulates including surface acid groups, said surface acid groups provided by acid monomers copolymerized with other monomers to form the polymer colloid particulates, said acid monomers being present at from 1 wt% to 15 wt% of total monomers used to form the polymer colloid particulates (2:23 – 3:1, 4:17 – 5:14, 6:29 – 8:2, 12:1 – 14:8), and
  - iii) polymer-encapsulated pigment colorants dispersed in the liquid vehicle (3:31 – 4:16, 7:15-21, 8:1-2, 12:1-10); and
- b) heating the image once it is printed on the non-porous substrate (14:9-22).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The issues presented for review are: (1) whether claims 12-17, 23, 25-31, 37, and 39-44 are unpatentable under 35 U.S.C. § 102(e) as being anticipated by U.S. Publication No. 2004/0063807 to Wang et al. (hereinafter “Wang”) in view of evidence given in *Hawley’s Condensed Chemical Dictionary*; (2) whether claims 12-17, 23, 25-31, 37, and 39-44 are unpatentable under 35 U.S.C. § 103(a) over Wang in view of evidence given in *Hawley’s Condensed Chemical Dictionary*; (3) whether claims 12-16, 18, 23, 25-30, 32, 37, and 39-44 are unpatentable under 35 U.S.C. § 103(a) over Wang in view of U.S. Publication No. 2004/0229974 to Miyabayashi (hereinafter “Miyabayashi”); (4) whether claims 12-15, 17-18, 23, 25-29, 31-32, 37, and 39-44 are unpatentable under 35 U.S.C. § 103(a) over U.S. Publication No. 2003/0069329 of Kubota et al. (hereinafter “Kubota”) in view of *Hawley’s Condensed Chemical Dictionary* and either U.S. Patent No. 6,536,890 to Kato et al. (hereinafter “Kato”) or U.S. Patent No. 5,207,824 to Moffatt et al. (hereinafter “Moffatt”); and (5) whether Claims 12-16, 18, 23, 25-30, 32, 37, and 39-44 were rejected under 35 U.S.C. § 103(a) as being unpatentable under 35 U.S.C. § 103(a) over Kubota in view of *Hawley’s Condensed Chemical Dictionary* and either Kato and Moffatt and further in view of U.S. Patent Publication No. 2004/0055508 of Miyamoto et al. (hereinafter “Miyamoto”) or Wang.

VII. ARGUMENT

A. Prosecution History

The present application was filed on February 5, 2004 as U.S. Patent Application Serial No. 10/772,792, and is entitled POLYMER COLLOID-CONTAINING INK-JET INKS FOR PRINTING ON NON-POROUS SUBSTRATES. The present application was filed as an original utility application.

In the first Office Action mailed April 20, 2006, the Examiner rejected pending claims 1-40. Specifically, all claims were rejected under at least one of a number of rejections under 35 U.S.C. § 102 and § 103 over a number of references either alone or in combination (U.S. Published Application No. 2006/0007287 to Cagle, U.S. Patent No. 5,750,592 to Shinozuka, U.S. Patent No. 6,864,602 to Miyabayashi (hereinafter “Miyabayashi ‘602”), U.S. Published Application No. 2004/0229974 also to Miyabayashi (hereinafter “Miyabayashi”), U.S. Published Application No. 2003/0069329 to Kubota, *Hawley’s Condensed Chemical Dictionary*, U.S. Published Application No. 2004/0024083 to Lee, U.S. Published Application 2004/0055508 to Miyamoto, U.S. Patent No. 6,451,103, U.S. Patent No. 6,536,890 to Kato, and U.S. Patent No. 6,786,586 to Koga).

In a response filed on August 21, 2006, including a petition and fee for a one-month extension, claims 1-11, 19-21, 24, 33-35, and 38 were canceled, claims 12, 26, and 39 were amended. Additionally, the Appellant argued that the rejections were either rendered moot in light of the amendments and cancellations to the claims, or that the rejections failed for lack of teaching every element of the claims.

In a Final Office Action dated November 22, 2006, all rejections were overcome except for the following: claims 12-16, 23, 25, 30, 37, and 39-40 under 35 U.S.C. § 102(b) as anticipated by Shinozuka; claims 12-15, 17-18, 23, 25-29, 31-34, 37, and 39-40 under 35 U.S.C. § 102(e) as anticipated by Miyabayashi; claims 12-15, 17-18, 23, 25-29, 31-32, 37, and 39-40 under 35 U.S.C. § 102(e) as anticipated by Kubota in view of *Hawley's Condensed Chemical Dictionary*; claims 16 and 30 under 35 U.S.C. § 103(a) as unpatentable over Miyabayashi or Kubota, either in view of either Miyamoto or Uemura; and claims 22 and 36 under 35 U.S.C. § 103(a) as unpatentable over Miyabayashi or Kubota, either in view of Kato.

A Request for Continued Examination (RCE) was filed on February 22, 2007. Claims 22 and 36 were canceled. Claims 12 and 26 were amended to include limitations of original claims 22 and 36, respectively. The rejections based on 35 U.S.C. § 102, and the rejection based on 35 U.S.C. § 103(a) over Miyabayashi and Kubota in view of Miyamoto or Uemura were rendered moot by the amendment of the subject matter of claims 22 and 36 into the independent claims. The Appellant argued that the remaining rejection of Miyabayashi and Kubota in view of Kato failed for lack of proper motivation to combine, lack of reasonable success in combining the references, and failure to teach each and every element of the claims.

In an Office Action dated May 15, 2007, all pending claims were rejected. Specifically, claims 12-17, 23, 25-31, 37, and 39-40 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Published Application No. 2004/0063807 to Wang in view of *Hawley's Condensed Chemical Dictionary*; claims 18 and 32 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang in view of Miyabayashi; claims 12-15, 17-18, 23, 25-29, 31-32, 37, and 39-40 were rejected under 35 U.S.C. § 103(a) as unpatentable over Kubota in view of

*Hawley's Condensed Chemical Dictionary* and either Kato or U.S. Patent No. 5,207,824 to Moffatt; and claims 16 and 30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kubota in view of *Hawley's Condensed Chemical Dictionary* and either Kato and Moffatt and further in view of Miyamoto or Wang.

A response was filed on August 15, 2007, wherein claims 12 and 26 were amended to include the subject matter of claims 17 and 31, and claims 41-44 were added. Appellant argued that the rejections were improper for a number of reasons.

The Examiner sent a Non-Final Office Action on November 1, 2007, noting the entering of the amendment and rejecting all pending claims. The rejection of claims 12-17, 23, 25-31, 37, and 39-44 under 35 U.S.C. § 102(e) as being anticipated by Wang in view of *Hawley's Condensed Chemical Dictionary* was maintained. Claims 12-17, 23, 25-31, 37, and 39-44 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang in view of *Hawley's Condensed Chemical Dictionary*; claims 12-16, 18, 23, 25-30, 32, 37, and 39-44 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Miyabayashi; claims 12-15, 17-18, 23, 25-29, 31-32, 37, and 39-44 were rejected under 35 U.S.C. § 103(a) as unpatentable over Kubota in view of *Hawley's Condensed Chemical Dictionary* and either Kato or Moffatt; claims 12-16, 18, 23, 25-30, 32, 37, and 39-44 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kubota in view of *Hawley's Condensed Chemical Dictionary* and either Kato and Moffatt and further in view of Miyamoto or Wang.

Appellant filed a response on January 29, 2008, wherein claims 13-14 and 27-28 were amended. Arguments were made in favor of patentability of all claims. A Final Office Action was issued on April 17, 2008, wherein all rejections were maintained. Appellant responded with

a response under 37 C.F.R. § 1.116, sent June 17, 2008, including arguments in favor of patentability.

Upon receiving an Advisory Action on August 13, 2008, noting that the request for reconsideration had been considered but did not place the application in condition for allowance, Appellant decided it would be beneficial to appeal the present claims so that a neutral third party could decide these issues. Appellant filed a Notice of Appeal on September 4, 2008.

The shortcomings of the rejections will now be reviewed. Arguments and statements by Appellant made earlier but not repeated here are also part of the record for this appeal and are not waived; although they may be modified or supplemented herein. To keep this brief short while still trying to provide an adequate basis for review, some observations and arguments that might have been presented are not included. Accordingly, Appellant's silence herein with respect to particular statements by the United States Patent and Trademark Office does not indicate agreement with or acquiescence thereto.

B. Appellant's Invention

The present invention is directed toward a system (claim 12) and method (claim 26) for printing images. In accordance with embodiments of the claimed invention, this system includes an ink-jet ink, a thermal ink-jet printhead configured for printing ink-jet ink, a non-porous substrate configured for receiving the ink-jet ink upon printing, and a heating element configured for heating the image once it is printed on the non-porous substrate. The ink-jet ink includes an aqueous liquid vehicle having at least one volatile co-solvent, where each volatile co-solvent present has a boiling point at or below about 285°C, and where the total amount of volatile co-solvent present in the ink-jet ink is from 5 wt% to 50 wt%. The ink-jet ink also includes acid-

functionalized polymer colloid particulates dispersed in the liquid vehicle, where the acid-functionalized polymer colloid particulates include surface acid groups provided by acid monomers copolymerized with other monomers to form the polymer colloid particulates. The acid monomers are present at from 1 wt% to 15 wt% of total monomers used to form the polymer colloid particulates. The ink-jet ink further includes polymer-encapsulated pigment colorants dispersed in the liquid vehicle.

Claim 26 sets forth a method of printing an image with good rub resistance including ink-jetting from a thermal ink-jet printhead an ink-jet ink onto a non-porous substrate to form the image and heating the image once it is printed on the non-porous substrate. As with the system claim outlined above, the ink-jet ink includes an aqueous liquid vehicle having at least one volatile co-solvent, where each volatile co-solvent present has a boiling point at or below about 285°C, and where the total amount of volatile co-solvent present in the ink-jet ink is from 5 wt% to 50 wt%. The ink-jet ink also includes acid-functionalized polymer colloid particulates dispersed in the liquid vehicle, where the acid-functionalized polymer colloid particulates include surface acid groups provided by acid monomers copolymerized with other monomers to form the polymer colloid particulates. The acid monomers are present at from 1 wt% to 15 wt% of total monomers used to form the polymer colloid particulates. The ink-jet ink further includes polymer-encapsulated pigment colorants dispersed in the liquid vehicle.

All remaining pending claims depend on one of claim 12 and claim 26.

C. Rejections under 35 U.S.C. § 102

Claims 12-17, 23, 25-31, 37, and 39-44 were rejected under 35 U.S.C. § 102 over Wang (U.S. Publication No. 2004/0063807) in view of evidence given in *Hawley's Condensed*

*Chemical Dictionary*. Before discussing the rejection, it is thought proper to briefly state what is required to sustain such a rejection. It is well settled that "[a] claim is anticipated only if each and every element as set forth in the claims is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil of California*, 814 F.2d 628, 2 U.S.P.Q. 2d 1051, 1053 (Fed. Cir. 1987). In order to establish anticipation under 35 U.S.C. 102, all elements of the claim must be found in a single reference. *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 231 U.S.P.Q. 81, 90 (Fed. Cir. 1986), *cert. denied* 107 S.Ct. 1606 (1987). In particular, as pointed out by the court in *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1981), *cert denied*, 469 U.S. 851 (1984), "anticipation requires that each and every element of the claimed invention be disclosed in a prior art reference." "The identical invention must be shown in as complete detail as is contained in the...claim." *Richardson v. Suzuki Motor Co.* 9 U.S.P.Q. 2d 1913, 1920 (Fed. Cir. 1989).

i. The Wang Reference

Wang discloses an aqueous ink-jet ink including a pigment, a polymer latex having at least one halogenated vinyl monomer, a surfactant and a humectant. An ink and receiver combination for a non-absorbing substrate is also provided. See Abstract. Although Wang states that the pigment can be self-dispersible, encapsulated, or stabilized by a dispersant, only pigments stabilized by a separate dispersant are exemplified. See [0023] and Examples [0056-0085]. Additionally, of the 27 types of pigments listed in paragraph [0029], no encapsulated pigments are listed, and of the 287 explicitly identified individual pigments, it does not appear that encapsulated pigments are listed. See [0029]. It is also worthy to note that not a single acid monomer containing latex appears to be exemplified. See Examples [0056-0085]. Thus, though

encapsulated pigments are mentioned briefly, there is no specific combination of a polymer-encapsulated pigment in combination with an acid monomer-containing latex taught anywhere in Wang.

ii. Claims 12-17, 23, 25-31, 37, and 39-40

Independent claims 1 and 26, from which claims 12-17, 23, 25-31, 37, and 39-40 depend, require that the latex includes surface acid groups provided by acid monomers being present from 1 wt% to 15 wt% of the latex. The Examiner has alleged that this limitation is taught since Wang discloses that the polymer latex contain less than 50 mol % of a hydrophilic monomer such as methacrylic acid. However, Wang teaches a certain mol % of hydrophilic monomers, as opposed to the present invention which recites 1 wt% to 15 wt% of an acidic monomer containing latex. Specifically, Wang explicitly lists 26 hydrophilic monomers, of which only 4 are acidic. See [0043]. Thus, there appears to be no teaching in Wang that recognizes the difference between acidic monomers and merely hydrophilic monomers, nor is there any teaching in Wang that would lead one skilled in the art to select a specific weight percentage of acidic monomers over other non-acidic monomers, and then use the latex formed therefrom in combination with polymer-encapsulated pigments (which are not discussed in any detail other than to briefly mention their possible use).

Because this specific combination is not taught in the reference, the rejection relies on inherency rather than a direct teaching for the claimed combination, as such, it is notable that in order to establish inherency, extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Even if a prior art reference is capable of being modified

and the modification would anticipate the invention, this is not sufficient to support an anticipation rejection based on inherency. In other words, it appears that the Examiner is arguing that this combination is inherent in the reference, because encapsulated pigments are mentioned in passing, and in a separate place, 4 of 26 hydrophilic monomers that can be used in a polymer are acidic.

As the rejection is particularly relying on this doctrine, the Appellant wishes to provide the applicable case law. Specifically, the Federal Circuit Court of Appeals stated “[u]nder the doctrine of inherency, if an element is not expressly disclosed in a prior art reference, the reference will still be deemed to anticipate a subsequent claim if the missing element ‘is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill’” (citations omitted). Rosco, Inc. v. Mirror Lite Co., 304 F.3d 1373, 1380 (Fed. Cir. 2002). The Court further states that “[i]nherent anticipation requires that the missing descriptive material is “necessarily present,” not merely probably or possibly present, in the prior art” (citations omitted). Id. As such, the Appellant submits that the appropriate standard in establishing an anticipatory rejection through inherency has been well defined by the courts, and has not been met in the present case.

The fact that Wang explicitly teaches hydrophilic monomers would not necessarily require them to be acidic, nor would one skilled in the art recognize such a limitation. Also, the Appellant contends that to combine the elements as proposed in the rejection would be a modification of the teachings of Wang as Wang does not explicitly teach the use of acidic monomers or provide an example of such, particularly in combination with the other elements described above. Furthermore, the Appellant submits that, until the Patent Office establishes

each and every element, the burden does not shift to the Appellant, as a *prima facie* case has not been established.

Specifically, the Patent Office has not provided the present combination of elements. For example, even though Wang generally discloses different types of pigments, including self-dispersed, encapsulated, and dispersed, can be used in its invention, Wang explicitly lists types of pigments and specific individual pigments in paragraph [0029] of the specification. Notably missing from paragraph [0029] is any reference to an encapsulated pigment. Additionally, Wang provides no examples of inks containing encapsulated pigments. As such, the Examiner is picking and choosing discrete briefly mentioned possibilities and combining them in a manner not specifically taught by Wang. In other words, the combination of an encapsulated pigment and an acid monomer-containing polymer is an element itself, and this specific combination is not taught by the reference. The Appellant notes that providing the elements is not sufficient to sustain the rejection, but the Patent Office must show the identical invention in as complete detail (per *Richardson v. Suzuki Motor Co.*) as is contained in the claim. Since this combination has not been shown by the reference, the Appellant submits that the Patent Office has not met this standard.

The Examiner has responded to the above arguments arguing that the Examiner has not relied upon inherency; rather the Examiner argues that Wang teaches the elements in enough specificity to anticipate the present invention. See Final Office Action of April 17, 2008, page 4. However, such an argument would then necessarily equate the hydrophilic monomers disclosed in Wang as acidic monomers. There is no reason to pick acid functionalized polymers over mere hydrophilic monomers by reading the reference, and there is no teaching that would lead one

skilled in the art to select this specific type of pigment and combine it with this specific type of polymer colloid. The Appellant submits that such a reading is inconsistent with the disclosure in Wang, as discussed above. There is absolutely no teaching or disclosure in Wang that provides the present combination of elements in as complete detail as contained in the present claims. In other words, the Appellant submits that it is not enough for the rejection to identify elements in a single reference where such elements are merely found in laundry list of components, rather the rejection must show the invention in as complete detail as found in the claims. Stated another way, the Appellant freely admits that polymer encapsulated pigments and acid-functionalized polymer colloid particulates existed prior to the filing of the present application. It is the combination of these two elements, in combination with a thermal ink-jet printhead and non-porous media that is claimed here. This combination is nowhere in Wang.

The Examiner and Appellant agree that that the reference need not necessarily exemplify the invention to be anticipatory. The Appellant respectfully submits, however, that Wang does not only fail to teach this combination by example, but furthermore, Wang does not teach or disclose this combination in any other form; i.e., text, table, figure, general description, etc. As such, reversal of this rejection is respectfully requested.

iii. Claims 41-44

Claims 41-44 address density and surface dielectric properties of the acid-functionalized polymer colloid particulates. The Examiner has dismissed these claim elements alleging that they appear typical or would be necessary and inherent. However, such unsubstantiated allegations are not a substitute for prior art or other evidence necessary to establish anticipation. The Appellant submits that these claim elements necessarily limit the scope of the independent

claims from which they depend.

As with the rejection of claims 12-17, 23, 25-31, 37, and 39-40 discussed above, the rejection of claims 41-44 relies on inherency rather than a direct teaching for the claimed combination, as such, it is notable that in order to establish inherency, extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Even if a prior art reference is capable of being modified and the modification would anticipate the invention, this is not sufficient to support an anticipation rejection based on inherency. Case law regarding inherency is outlined in the section immediately above and is incorporated herein.

The Appellant contends that the claim elements are not inherent in the teachings of Wang. Rather, the claim elements further limit the types of particulates covered by the claim and would necessarily exclude any particulate that does not contain the recited density or surface dielectric constant. Given the relatively large number of potential particles that would otherwise be covered by the independent claims, such a restriction is meaningful and limiting, and would necessarily disclaim most particles not meeting the recited limitations. Thus, this limitation should not be viewed as inherent, but rather, as a significant limitation on the claims which has not been shown by the prior art. Reversal of this rejection is therefore respectfully requested.

iv. Claims 13-14 and 27-28

Claims 13-14 and 27-28 relate to the amount of non-volatile co-solvents present in the aqueous vehicle. The rejection of the claims relies on the proposition that the claim language of “no more than” encompasses 0 wt%, and therefore the claim element need not be present. The Appellant respectfully disagrees. The claim language states “wherein the liquid vehicle further

comprises a non-volatile co-solvent in an amount of no more than" a certain percentage (10 or 2). Underlining added. As such, the claims explicitly require a non-volatile co-solvent, and further require an amount of the non-volatile co-solvent. Under the Examiner's claim construction, the amount can be 0 wt%. As a matter of claim differentiation, the dependent claims of 13-14 and 27-28 further comprise an additional element, and therefore, require that element to be present. In other words, it is clear that the "further comprises" language requires that the ingredient be present, otherwise, this language would have no meaning. As such, the Appellant maintains the position that these dependent claims provide an additional element that is not taught by the present reference.

D. Rejections under 35 U.S.C. § 103

Claims 12-18, 23, 25-32, 37, and 39-40 have been rejected as being obvious in view of several references. Before discussing the obviousness rejections herein, it is thought proper to briefly state what is required to sustain such a rejection. The issue under § 103 is whether the Patent Office has stated a case of *prima facie* obviousness. The Appellant does not deem it necessary to recite the entire case law standard required in order to establish a *prima facie* case of obviousness. However, the Appellant briefly notes the required three criteria for a *prima facie* case of obviousness, namely 1) that the asserted references as modified or combined must teach or suggest each and every element of the claimed invention, 2) that the asserted references as modified or combined must provide a sufficient likelihood of successfully making the modification or combination, and 3) that the reason for the modification or combination asserted must be identified. The Appellant respectfully asserts the Patent Office has not satisfied the requirement for establishing a case of *prima facie* obviousness in any of the rejections. As all

rejections rely on one of two primary references, Wang and Kubota, a brief discussion of these references is provided, along with two secondary references.

i. The Wang Reference

As previously noted, Wang discloses an aqueous ink-jet ink including a pigment, a polymer latex having at least one halogenated vinyl monomer, a surfactant and a humectant. An ink and receiver combination for a non-absorbing substrate is also provided. See Abstract. Although Wang states that the pigment can be self-dispersible, encapsulated, or stabilized by a dispersant, only pigments stabilized by a separate dispersant are exemplified or discussed in any detail. See [0023] and Examples [0056-0085]. Additionally, of the 27 types of pigments listed in paragraph [0029], no encapsulated pigments are listed, and of the 287 explicitly identified individual pigments, it does not appear that encapsulated pigments are listed. See [0029]. It is also worthy to note that not a single acid monomer containing latex appears to be exemplified or discussed. See Examples [0056-0085]. The reference also only mentions a few acid monomers as being possibilities for use. Furthermore, the reference never teaches or suggests that these two sparse teachings (encapsulated pigment and acid-functionalized polymer colloid particulates) should be or are combined together.

ii. The Miyabayashi Reference

Miyabayashi teaches a microencapsulated pigment where pigment particles with an anionic group on the surface are coated with a polymer. Ink-jet inks including the microencapsulated pigment and water, and methods of printing with the ink-jet inks are taught. See Abstract. Miyabayashi also teaches that heating of printed matter may be necessary to

accommodate polymers with high transition temperatures. See [0245]. Miyabayashi does not disclose the use of a thermal ink-jet printer.

iii. The Kubota Reference

Kubota teaches an ink composition with colorant, resin emulsion particles, water-soluble organic solvent, water and a reaction solution. The reference further discusses a recording method using the ink composition. See Abstract. Specifically, the recording method comprises the steps of depositing a reaction solution on the recording medium, depositing an ink composition on the recording medium, and washing the recording medium. See [0025-0028]. Kubota does not teach the use of thermal ink-jet architecture.

iv. The Kato Reference

Kato teaches compositions and methods for improving optical density and saturation by ink-jet recording. Kato teaches using a liquid composition with cationic micro-particles in combination with a separate anionic ink composition. An image can be formed by applying both the liquid composition and the anionic ink to a recording medium such that the two liquid compositions contact one another on the recording medium. See Abstract.

v. Rejection of Claims 12-17, 23, 25-31, 37, and 39-44 Over Wang

The Examiner has rejected claims 12-17, 23, 25-31, 37, and 39-44 over Wang in view of evidence given in *Hawley's Condensed Chemical Dictionary*. The Appellant submits that the rejection provides no reason why a person skilled in the art would pick and choose a certain pigment with a certain latex containing an acidic monomer from the present combination of references since the references are absolutely devoid of any teachings or disclosure regarding the specific combination as presently claimed. For example, there is no teaching or disclosure in the

reference or in the art in general that would lead one skilled in the art to choose a latex with an acidic monomer of 1 wt% to 15 wt% with a polymer-encapsulated pigment.

The rejection fails to provide a reason why a person skilled in the art would make such a combination, which simply fails to support a *prima facie* case of obviousness. Furthermore, the Appellant submits that reasons of achieving good rub resistance, good waterfastness, lightfastness, abrasion resistance, good adhesion to non-absorbing substrates, or any other quality disclosed in Wang, could not be a reason to combine a latex monomer with an acidic monomer of 1 wt% to 15 wt% with an encapsulated pigment since Wang already seems to accomplish this with non-acidic latexes and non-encapsulated pigments.

The Appellant submits that the rejection is based on improper hindsight to reconstruct the instantly claimed invention while using the Appellant's specification as a roadmap. The court has stated that an Applicant's specification cannot be the basis for motivation, i.e., no hindsight reconstruction. Yamonouchi Pharmaceutical Co., Ltd. v. Danbury Pharmacal, Inc., 231 F.3d 1339, 56 U.S.P.Q.2d 1641 (Fed. Cir.), reh'g denied, 2000 U.S. App. LEXIS 34047 (2000).

Accordingly, if a prior art reference is sought to provide a specific element of a claim with the use of hindsight, any rejection based thereon is improper and should be withdrawn. The rejection selectively picks and chooses single elements in an attempt to combine them as presently outlined in the instant disclosure. However, the rejection fails to provide any apparent reason why one skilled in the art would attempt to combine the elements in the manner presently indicated. Furthermore, the Appellant submits that there is no reason generally known in the art or provided in the cited references that would direct someone to provide the present combination.

a. Claims 13-14, 27-28, and 41-44

Additionally, the Appellant submits that the present rejection does not teach each and every element as recited in claims 13-14, 27-28, and 41-44; i.e., density, surface dielectric constants, and non-volatile co-solvent. The rejection relies upon inherency in providing these elements. However, such reliance is misplaced based on the current case law regarding the use of inherency in establishing a proper § 103 rejection.

The Appellant wishes to provide the current case law regarding the use of inherency in establishing a proper § 103 rejection. In In re Rijckaert, the Court concluded that even though the Board had found that a certain condition was known to be optimal, the Court concluded that the condition was not necessarily inherent and overturned the 103 rejections based on such inherency. 9 F.3d 1531, 1533-34 (Fed. Cir. 1993). Specifically, the Court provided several inherency standards applicable to obviousness, including:

“[t]he mere fact that a certain thing may result from a given set of circumstances is not sufficient [to establish inherency.]” In re Oelrich, 666 F.2d 578, 581-82, 212 USPQ 323, 326 (CCPA 1981) (citations omitted). “That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown.” In re Spormann, 53 C.C.P.A. 1375, 363 F.2d 444, 448, 150 USPQ 449, 452 (CCPA 1966). Such a retrospective view of inherency is not a substitute for some teaching or suggestion supporting an obviousness rejection. See In re Newell, 891 F.2d 899, 901, 13 USPQ2d 1248, 1250 (Fed. Cir. 1989).

As applied to the present case, the mere fact that the present particulates may result from the materials found in Wang is not enough to establish inherency. Additionally, and for argument’s sake, even if the present combination may be inherent from Wang’s description, the present combination of materials was not known. As found in In re Newell, the Examiner’s retrospective view in the present case does not establish a *prima facie* case of obviousness as the presently

recited elements are not necessarily inherent or qualify as inherent under the current case law regarding obviousness. Furthermore, the Appellant submits that as a *prima facie* case of obviousness has not been established, the burden has not shifted to the Appellant, but remains with the Patent Office until such a *prima facie* case is properly established.

The Patent Office has responded to the above arguments, alleging that the Examiner is not relying on inherency. See Final Office Action of April 17, 2008, page 8. Absent inherency or any disclosure regarding the elements of density, surface dielectric constants, and non-volatile co-solvent, the Appellant submits that the Examiner has not provided a combination of references that teach each and every element of those claims.

Even though the Examiner's response contends that inherency is not relied upon, the Appellant notes that the Examiner further argues that these elements are "necessarily inherent" and "[t]he argued parameters are things which are not typically mentioned in the prior art nor measured." See Office Action, page 8. The Appellant understands this reasoning to rely on inherency of the noted parameters, and is contradictory to the Examiner's claim of not relying on inherency. In other words, the Examiner is arguing that these parameters are inherently present. As such, the inherency case law previously cited by the Appellant is material to the present rejection. Furthermore, as discussed above, the Appellant contends that the Patent Office has not met the inherency standard for establishing a proper 103 rejection. It is noted that if inherency is relied upon, the Appellants want to make it clear that there are many possible latexes that would not have the claimed density and surface dielectric constants. These are real limitations that exclude many possible combinations of monomers (ratios, selection of monomers, etc.). Reversal of this rejection is respectfully requested.

b. Claims 13-14 and 27-28

The Appellant also notes that the Patent Office has given no patentable weight to claims 13-14 and 27-28. As recited in the discussion regarding the rejection of the same claims under § 102, the rejection of the claims relies on the proposition that the claim language of “no more than” encompasses 0 wt%, and therefore the claim element need not be present. The Appellant again respectfully disagrees. The claim language states “wherein the liquid vehicle further comprises a non-volatile co-solvent in an amount of no more than” a certain percentage (10 or 2). Underlining added. As such, the claims explicitly require a non-volatile co-solvent, and further require an amount of the non-volatile co-solvent not to exceed a certain amount. As a matter of claim construction, this solvent must be present, or the term “further comprises” would have no meaning. As such, the Appellant maintains the position that these dependent claims provide an additional element that is not taught by the present reference. Reversal of this rejection is respectfully requested.

vi. Rejection of Claims 12-16, 18, 23, 25-30, 32, 37, and 39-44 Over Wang in view of Miyabashi

Claims 12-16, 18 23, 25-30, 32, 37, and 39-44 have been rejected over Wang in view of Miyabashi. Specifically, the Examiner has used Miyabashi to provide the amount of crosslinking monomer recited in claims 18 and 32, which is not disclosed in Wang. However, as previously discussed above, Wang does not provide an ink composition having 1 wt% to 15 wt% of an acidic monomer containing latex in specific combination with a polymer-encapsulated pigment. Furthermore, the Appellant submits that Miyabashi does not correct the deficiencies of Wang. The Applicant renews the above arguments and requests reversal of this rejection.

vii. Rejection of Claims Over Kubota in view of Various References

The Patent Office has used Kubota in view of various combinations of Kato, Moffatt, Miyamoto, and Wang. Specifically, claims 12-15, 17-18, 23, 25-29, 31-32, 37, and 39-44 were rejected as unpatentable over Kubota in view of *Hawley's Condensed Chemical Dictionary* and either Kato or Moffatt. Claims 12-16, 18, 23, 25-30, 32, 37, and 39-44 were rejected as unpatentable over Kubota in view of *Hawley's Condensed Chemical Dictionary* and either Kato and Moffatt and further in view of Miyamoto or Wang. Regarding Kato, the Examiner cites to a brief section of the disclosure noting that ink according to the invention can be used with thermal ink-jet architecture. Immediately thereafter, the disclosure teaches that when used with an ink-jet recording method, the thermal properties (e.g. specific heat, thermal expansion coefficient, thermal conductivity) may have to be regulated.

The rejection focused on the motivation of Kato for ink ejected on stable basis with no satellite dots produced as the basis for the combination. However, as noted in the present Application, configuring a system including thermal ink-jet architecture often requires additional consideration and experimentation of at least selection of ink components. To quote the disclosure,

“As a further note, thermal ink-jet systems are quite different in their jetting properties than piezo ink-jet systems. As such, polymer colloid particulates that are effective for use in piezo ink-jet systems are not necessarily effective for use with thermal ink-jet ink systems. However, the converse is not necessarily true. In other words, polymer colloid particulates that work well with thermal ink-jet systems are more likely to work with piezo systems than *vice versa*. Therefore, the selection or manufacture of polymer colloid particulates for use with thermal ink-jet systems often requires more care, as thermal ink-jet systems are less forgiving than piezo ink-jet systems.” p. 14, ln. 30 – p. 15 ln. 6.

Such warning regarding the difficulty in working with thermal ink-jet architecture is echoed by Kato's brief statement above. Kato, however, does not deal with the combination of the ink components in a single fluid, as does the present invention. One of ordinary skill in the art would have no reason to combine the inks of Kubota with the thermal ink-jet architecture briefly noted in Kato. Additionally, the Appellant submits that Moffatt does not provide any teachings contrary to Kato or the discussion of thermal printing in the present specification.

The Patent Office has further argued that it would have been obvious to use a thermal ink-jet system since the ink is identical to the Appellant's claimed ink, however, such reasoning is based on circular logic, i.e., hindsight. One skilled in the art would not necessarily conclude that the ink in Kubota would be thermally ink-jettable based on the fact that the Appellant has successfully provided a thermal ink-jet ink, since, but for the present disclosure, one skilled in the art would have no idea that the Appellant had provided the ink, or that such ink could be thermally ink-jetted.

The rejection further argued that Kubota does not require that the ink is used in a piezo ink jet system, and thus, one skilled in the art would assume the ink is suitable for thermal ink-jet printing. However, such an argument is flawed. The lack of disclosure regarding thermal printing would not lead one skilled in the art to believe that thermal ink-jet would be implied, but quite the opposite. In other words, one skilled in the art would know how difficult thermal ink-jet printing is and would most likely conclude that such a broad range of compositions as disclosed in Kubota would more likely be piezo ink-jettable. In other words, it is generally understood that thermal ink-jet inks can be jetted by piezo means, but the reverse is not always true.

Additionally, such a combination would not provide a reasonable expectation of success to one skilled in the art, as the selection or manufacture of components for use with thermal ink-jet systems often requires a much greater level of care than with other ink-jet systems.

The Patent Office responsive argues that Kato actually supports the combination. Specifically, the rejection argues that Kato's warning supports that one skilled in the art has the ability to make a thermal printable ink. See Final Office Action April 17, 2008, page 14. The Appellant cannot agree with such an interpretation. Kato provides no evidence that one skilled in the art would have the ability to make any ink thermally jettable; rather the Appellant maintains the position that Kato serves to warn one skilled in the art that not every ink-jet ink is thermally compatible, or can be made thermally compatible, as outlined in the present specification. Furthermore, the Appellant notes the difficulty of thermal printing vs. piezo printing is well-known in the art. As such, the Appellant contends that using the ink from Kubota in a thermal printer from Kato would not be obvious to one skilled in the art at the time of the present invention.

Additionally, Kubota fails to disclose printing of an ink-jet ink including polymer-encapsulated pigment colorant and acid-functionalized polymer colloid particulates dispersed in a liquid vehicle having a volatile co-solvent, where the image is heated after printing. For example, the ink composition referred in the rejection (Ink 4, Table F2) was not subjected to heating. Conversely, the only compositions where heating was utilized (Ink composition A, Color Ink Set A) did not comprise polymer-encapsulated pigments—rather, the pigments and dispersants were combined by mere mixing. See [0241]. These examples in Kubota provide no teaching, therefore, of the combination of elements claimed in the present independent claims 12

and 26. Kato does not remedy this deficiency and therefore the combination does not teach each and every element, and therefore fails to sustain a *prima facie* case of obviousness.

Even though the rejection alleges that one must look at what the reference teaches as a whole, including non-preferred portions, the Appellant maintains that the reference as a whole including non-preferred portions do not teach the combination of elements as presently claimed. The Appellant submits that Kubota discloses thousands of possible combinations and that the Patent Office has provided no reason for one skilled in the art to pick the Appellant's present combination, if possible, absent the Appellant's present disclosure.

a. Claims 13-14, 27-28, and 41-44

The Appellant renews the above arguments with respect to dependent claims 13-14, 27-28, and 41-44. Specifically, the Examiner has not showed the elements of these dependent claims in any reference. Additionally, as previously discussed, the cited characteristics are not inherent to the particulates but serve to limit that particulates covered by the independent claims. Absent inherency or any disclosure regarding the elements of density, surface dielectric constants, and non-volatile co-solvent, the Appellant submits that the Patent Office has not provided a combination of references that teach each and every element of those claims.

As discussed, the present combination of references does not teach each and every element as recited in claims 13-14, 27-28, and 41-44; i.e., density, surface dielectric constants, and non-volatile co-solvent. The rejection relies upon inherency in providing these elements. However, such reliance is misplaced based on the current case law regarding the use if inherency in establishing a proper § 103 rejection. Appropriate case law regarding the use of inherency in

establishing a proper § 103 rejection has previously been provided and is hereby referenced and incorporated.

As applied to the present case, the mere fact that the present particulates may result from the materials found in Wang is not enough to establish inherency. Additionally, and for argument's sake, even if the present combination may be inherent from any of the cited combinations of references, the present combination of materials was not known. As found in *In re Newell*, the Examiner's retrospective view in the present case does not establish a *prima facie* case of obviousness as the presently recited elements are not necessarily inherent or qualify as inherent under the current case law regarding obviousness. Furthermore, the Appellant submits that as a *prima facie* case of obviousness has not been established, the burden has not shifted to the Appellant, but remains with the Patent Office until such a *prima facie* case is properly established.

b. Claims 13-14 and 27-28

Furthermore, the Appellant notes that the Patent Office has given no patentable weight to claims 13-14 and 27-28. As recited in the discussion regarding the rejection of the same claims under § 102, the rejection of the claims relies on the proposition that the claim language of "no more than" encompasses 0 wt%, and therefore the claim element need not be present. The Appellant again respectfully disagrees. The claim language states "wherin the liquid vehicle further comprises a non-volatile co-solvent in an amount of no more than" a certain percentage (10 or 2). As such, the claims explicitly require a non-volatile co-solvent, and further require an amount of the non-volatile co-solvent. Under the Examiner's claim construction, the amount can be 0 wt%. However, such an interpretation would provide no additional limitation to the

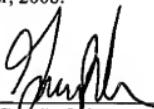
independent claim. As a matter of claim differentiation, the dependent claims of 13-14 and 27-28 further comprise an additional element, and therefore, require that element to be present. As such, the Appellant maintains the position that these dependent claims provide an additional element that is not taught by the present reference.

E. Conclusion

In conclusion, Appellant respectfully submits that the claims on appeal set forth in the Appendix are patentably distinct from the asserted prior art references. Particularly, the present independent claims, and subsequent dependent claims contain element not taught in Wang, that the specific claimed combination is not taught by Wang, that the present elements cannot be established through inherency, that Wang does not teach the additional element found in the dependent claims, and furthermore that the deficiencies of Wang are not remedied by combining with Miyabayashi. Furthermore, the cited combinations with Kubota fails to provide reasonable expectation of successfully combining the references, fails to teach each and every element of the present claims, and the Patent Office has failed to identify a reason for one skilled in the art to make the present combination.

Since the Patent Office has not met its initial burden of establishing a *prima facie* case of obviousness, the Appellant respectfully submits that all remaining rejections are improper, and should be overturned.

Dated this 4<sup>th</sup> day of November, 2008.



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VIII. CLAIMS APPENDIX

1 – 11. (canceled).

12. (previously presented) A system for printing images, comprising:

a) an ink-jet ink, including:

i) an aqueous liquid vehicle having at least one volatile co-solvent, each volatile co-solvent present having a boiling point at or below about 285°C, wherein the total amount of volatile co-solvent present in the ink-jet ink is from 5 wt% to 50 wt%,

ii) acid-functionalized polymer colloid particulates dispersed in the liquid vehicle, said acid-functionalized polymer colloid particulates including surface acid groups, said surface acid groups provided by acid monomers copolymerized with other monomers to form the polymer colloid particulates, said acid monomers being present at from 1 wt% to 15 wt% of total monomers used to form the polymer colloid particulates, and

iii) polymer-encapsulated pigment colorants dispersed in the liquid vehicle;

b) a thermal ink-jet printhead configured for printing ink-jet ink;

c) a non-porous substrate configured for receiving the ink-jet ink upon printing with the ink-jet printhead; and

d) a heating element configured for heating the image once it is printed on the non-porous substrate.

13. (previously presented) A system as in claim 12, wherein the liquid vehicle further comprises a non-volatile co-solvent in an amount of no more than 10 wt%.

14. (previously presented) A system as in claim 12, wherein the liquid vehicle further comprises a non-volatile co-solvent in an amount of no more than 2 wt%.

15. (original) A system as in claim 12, wherein the liquid vehicle is devoid of any non-volatile co-solvents.

16. (original) A system as in claim 12, wherein the liquid vehicle further includes a member selected from the group consisting of C<sub>1</sub> to C<sub>8</sub> aliphatic hydrocarbons, silicone, fluorocarbon surfactants, and combinations thereof.

17. (canceled).

18. (original) A system as in claim 12, wherein the acid-functionalized polymer colloid particulates are provided by multiple monomers copolymerized to form the polymer colloid particulates, said multiple monomers including at least one crosslinking monomer present at from 0.1 wt% to 3 wt% of total monomers used to form the polymer colloid particulates.

19 – 22. (canceled).

23. (original) A system as in claim 12, wherein the non-porous substrate is selected from the group consisting of plastic sheets, plastic films, coated papers, glass, and metal.

24. (canceled).

25. (original) A system as in claim 12, wherein the at least one volatile co-solvent is a humectant.

26. (previously presented) A method of printing an image with good rub resistance, comprising:

a) ink-jetting from a thermal ink-jet printhead an ink-jet ink onto a non-porous substrate to form the image, said ink-jet ink including:

i) an aqueous liquid vehicle having at least one volatile co-solvent, each volatile co-solvent present having a boiling point at or below about 285°C, wherein the total amount of volatile co-solvent present in the ink-jet ink is from 5 wt% to 50 wt%;

ii) acid-functionalized polymer colloid particulates dispersed in the liquid vehicle; said acid-functionalized polymer colloid particulates including surface acid groups, said surface acid groups provided by acid monomers copolymerized with other monomers to form the polymer colloid particulates, said acid monomers being present at from 1 wt% to 15 wt% of total monomers used to form the polymer colloid particulates, and

iii) polymer-encapsulated pigment colorants dispersed in the liquid vehicle; and

b) heating the image once it is printed on the non-porous substrate.

27. (previously presented) A method as in claim 26, wherein the liquid vehicle further comprises a non-volatile co-solvent in an amount of no more than 10 wt%.

28. (previously presented) A method as in claim 26, wherein the liquid vehicle further comprises a non-volatile co-solvent in an amount of no more than 2 wt%.

29. (original) A method as in claim 26, wherein the liquid vehicle is devoid of any non-volatile co-solvents.

30. (original) A method as in claim 26, wherein the liquid vehicle further includes a member selected from the group consisting of hydrocarbon surfactants, silicone surfactants, fluorocarbon surfactants, and combinations thereof.

31. (canceled).

32. (original) A method as in claim 26, wherein the acid-functionalized polymer colloid particulates are provided by multiple monomers copolymerized to form the polymer colloid particulates, said multiple monomers including at least one crosslinking monomer present at from 0.1 wt% to 3 wt% of total monomers used to form the polymer colloid particulates.

33 - 36. (canceled).

37. (original) A method as in claim 26, wherein the non-porous substrate is selected from the group consisting of plastic sheets, plastic films, coated papers, glass, and metal.

38. (canceled).

39. (previously presented) A method as in claim 26, wherein the heating step is carried out at a temperature effective to drive off enough of the volatile co-solvent to improve the image permanence.

40. (original) A method as in claim 26, wherein the at least one volatile co-solvent is a humectant.

41. (previously presented) A system as in claim 12, wherein the acid-functionalized polymer colloid particulates have a density of 0.9 g/cm<sup>3</sup> to 1.1 g/cm<sup>3</sup>.

42. (previously presented) A system as in claim 12, wherein the acid-functionalized polymer colloid particulates have a surface dielectric constant below 2.8.

43. (previously presented) A method as in claim 26, wherein the acid-functionalized polymer colloid particulates have a density of 0.9 g/cm<sup>3</sup> to 1.1 g/cm<sup>3</sup>.

44. (previously presented) A method as in claim 26, wherein the acid-functionalized polymer colloid particulates have a surface dielectric constant below 2.8.

IX. EVIDENCE APPENDIX

(None)

X. RELATED PROCEEDINGS APPENDIX

(None)